WHAT IS CLAIMED IS:

1. A method for generating an echo signal in a time-of-flight ranging system, said method comprising the steps of:

transmitting one or more bursts of energy towards a surface;

receiving reflected pulses from said surface, and converting said reflected pulses into an echo signal, said echo signal including one or more potential echo pulses;

applying an entropy filter to said echo signal, said entropy filter including determining whether information contained in said echo signal corresponds to a valid echo pulse or is substantially noise;

distinguishing those of said echo pulses determined as comprising noise in said echo signal.

2. The method as claimed in claim 1, wherein said step of applying an entropy filter comprises determining the number of times a predetermined pattern is found in a portion of said echo signal.

3. The method as claimed in claim 2, wherein said predetermined pattern comprises a bit pattern and said echo signal or a portion of said echo signal is characterized as a bit stream representing magnitude values in said echo signal.

4. The method as claimed in claim 3, wherein said predetermined pattern is applied according to a Monte Carlo technique.

5. The method as claimed in claim 1, comprising the steps of generating a plurality of echo signals, and applying said entropy filter to each of said entropy signals to generate to an entropy level for each of said entropy signals, and ranking said echo signals based on said entropy levels.

6. The method as claimed in claim 5, wherein said echo signals having entropy levels indicating low randomness are averaged to generate an average echo signal.

7. The method as claimed in claim 5, wherein said step of applying an entropy filter comprises determining the number of times a predetermined pattern is found in a portion of said echo signal.

8. The method as claimed in claim 7, wherein said predetermined pattern comprises one or more bit patterns and the portion of said echo signal is characterized as a bit stream representing magnitude values in said echo signal.

9. The method as claimed in claim 8, wherein said bit patterns are applied according to a Monte Carlo technique.

10. The method as claimed in claim 1, wherein said step of applying an entropy filter comprises selecting a portion of said echo signal and comparing said selected portion to a predetermined pattern, and if said selected portion matches said predetermined pattern within a threshold level, said echo signal is identified as comprising an echo pulse.

11. The method as claimed in claim 10, wherein said selected portion comprises a bit stream corresponding to magnitude values in said echo signal.

12. The method as claimed in claim 11, wherein said predetermined pattern comprises a bit pattern.

13. A level measurement device for measuring a distance to a material having a surface, said level measurement device comprising:

a transducer for emitting energy pulses and detecting energy pulses reflected by the surface of the material;

a controller having a receiver and a transmitter;

said transducer having an input port operatively coupled to said transmitter and being responsive to said transmitter for emitting said energy pulses, and said transducer including an output port operatively coupled to said receiver for outputting reflected energy pulses coupled by the transducer;

said receiver including a converter for converting said reflected energy pulses into signals;

said controller including a program component for generating an echo profile based on said signals;

said controller including another program component for applying an entropy based filter to the echo profile.

14. The device as claimed in claim 13, wherein said program component for applying an entropy-based filter comprises a program component for determining the information content in a portion of said echo profile.

15. The device as claimed in claim 14, wherein a high information content is indicative of a valid echo in said echo profile, and wherein a low information content is indicative of noise in said echo profile.

16. The device as claimed in claim 14, wherein said program component for determining the information content comprises a component for determining occurrences of one or more pre-selected patterns in the portion of said echo profile.

17. The device as claimed in claim 16, wherein said pre-selected pattern comprises a bit pattern and said portion of said echo profile is characterized as a bit stream representing magnitude values in said echo profile.

18. The device as claimed in claim 17, wherein said pre-selected pattern is applied according to a Monte Carlo technique.

19. A time of flight ranging system comprising:

a transducer for emitting energy pulses and detecting reflected energy pulses;

a controller having a receiver and a transmitter;

said transducer having an input port operatively coupled to said transmitter and being responsive to said transmitter for emitting said energy pulses, and said transducer including an output port operatively coupled to said receiver for outputting reflected energy pulses coupled by the transducer;

said receiver including a converter for converting said reflected energy pulses into signals;

said controller including a program component for generating an echo profile based on said signals, said echo profile comprising potential echoes and potential noise; and

said controller including another program component for applying an entropy filter to said echo profile to differentiate said potential noise from said potential echoes.

20. The device as claimed in claim 19, wherein said program component for applying an entropy-based filter comprises a program component for determining the information content in a portion of said echo profile.

21. The device as claimed in claim 20, wherein a high information content is indicative of a valid echo in said echo profile, and wherein a low information content is indicative of noise in said echo profile.